

## Complete Summary

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### GUIDELINE TITLE

Lead exposure in children: prevention, detection, and management.

### BIBLIOGRAPHIC SOURCE(S)

Lead exposure in children: prevention, detection, and management.  
Pediatrics 2005 Oct; 116(4): 1036-46. [59 references] [PubMed](#)

### GUIDELINE STATUS

This is the current release of the guideline.

All policy statements from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

Lead poisoning and lead exposure

### GUIDELINE CATEGORY

Counseling  
Diagnosis  
Management  
Prevention  
Screening

### CLINICAL SPECIALTY

Family Practice  
Pediatrics

#### INTENDED USERS

Physicians  
Public Health Departments

#### GUIDELINE OBJECTIVE(S)

To present recommendations for the prevention, detection, and management of lead exposure in children

#### TARGET POPULATION

Infants and young children

#### INTERVENTIONS AND PRACTICES CONSIDERED

1. Provision of anticipatory guidance on lead poisoning to parents of all infants and toddlers
2. Inquiring about lead hazards in housing and child care settings and inspection of suspicious homes
3. Measurement of blood lead concentration in Medicaid-eligible children
4. Following city or state health department guidance for lead screening in children not eligible for Medicaid or screening all children, preferably twice, at 1 and 2 years of age
5. Maintaining awareness of any special risk groups that are prevalent locally
6. Encouraging application for Housing and Urban Development (HUD) or other moneys available for remediation in areas with old housing and lead hazards
7. Keeping current with the work of the national Advisory Committee on Childhood Lead Poisoning Prevention and any relevant local committees concerning management of elevated blood levels in children

#### MAJOR OUTCOMES CONSIDERED

- Blood lead concentrations
- Subclinical and clinical effects of lead poisoning
- Costs of lead poisoning and benefits of prevention

### METHODOLOGY

#### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

#### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

#### NUMBER OF SOURCE DOCUMENTS

Not stated

#### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

#### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

#### METHODS USED TO ANALYZE THE EVIDENCE

Review

#### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

#### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

#### DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

#### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

#### COST ANALYSIS

##### Costs of Childhood Lead Poisoning and Benefits of Prevention

##### Cost-Benefit Analyses

The removal of lead from gasoline costs money, and it will cost more money to remove lead from housing. If childhood lead exposure, however, affects cognitive function and its consequences, such as graduating from high school, then it is plausible that it will affect social function, employment, and earnings. Several groups have estimated the long-term dollar costs of childhood lead exposure, assuming that the effect of lead on intelligence quotient (IQ) is linear and permanent; they also assume a specific economic value of increased intelligence quotients. One study estimated the economic benefit of the 25-year secular downward trend in childhood lead exposure in the cohort of children 2 years of age in 2000. The estimated increase in earnings for the 3.8 million children would

be between \$110 billion and \$319 billion over their lifetimes, compared with what they would have earned if they had been exposed to 1975 lead levels. Another study estimated the lifetime costs for each year's cohort of children currently exposed to lead to be \$43 billion. On the cost side, one researcher estimated a \$10 billion cost for deleading the estimated 2 million lead-contaminated houses that existed in 1990. In 2002, a more reliable estimate is that there are 4 million such lead-contaminated houses, and when adjusting for inflation (with the Consumer Price Index inflation calculator [[www.bls.gov/cpi](http://www.bls.gov/cpi)]), the earlier estimate becomes approximately \$28 billion in 2002. Combining these estimates leads to the conclusion that removing lead paint is cost-effective if it prevents even two-thirds of lead exposure for any single year's cohort of 2-year-olds. Similarly, a presidential task force estimated that the net nationwide benefit of interim control of lead hazards in the nation's pre-1960 housing would be \$1 billion to \$9 billion over 10 years. The benefit of abating the hazards permanently would be \$21 billion to \$38 billion. Such quantitation allows planning and setting priorities to be done more transparently, and allows comparisons to estimates of the cost for lead-abatement programs and other preventive activities. Although these are exemplary numbers in simplified analyses, all parts of which could be challenged, they illustrate the rationale for viewing lead exposure as a problem that should be solved, even on economic grounds.

## METHOD OF GUIDELINE VALIDATION

Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

Note from the National Guideline Clearinghouse (NGC): The American Academy of Pediatrics (AAP) recommendations for pediatricians for the prevention, detection, and management of lead exposure in children are provided below. See the [original guideline document](#) for recommendations geared to public health authorities, as well as a detailed discussion on the management of children with elevated blood lead concentrations. Users are also directed to related guidelines developed by the Centers for Disease Control and Prevention's Advisory Committee on Childhood Lead Poisoning.

- Centers for Disease Control and Prevention (CDC). Managing elevated blood lead levels among young children: recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention. Atlanta (GA): Centers for Disease Control and Prevention (CDC); 2002 Mar. 128 p. [53 references] See the [NGC Summary](#).
- Centers for Disease Control and Prevention (CDC). Preventing lead poisoning in young children. Atlanta (GA): Centers for Disease Control and Prevention (CDC); 2005 Aug. 101 p. [139 references] See the [NGC Summary](#).

## Recommendations for Pediatricians

1. Provide anticipatory guidance to parents of all infants and toddlers about preventing lead poisoning in their children. In particular, parents of children 6 months to 3 years of age should be made aware of normal mouthing behavior and should ascertain whether their homes, work, or hobbies present a lead hazard to their toddler. Inform parents that lead can be invisibly present in dust and can be ingested by children when they put hands and toys in their mouths.
2. Inquire about lead hazards in housing and child-care settings, as is done for fire and safety hazards or allergens. If suspicion arises about the existence of a lead hazard, the child's home should be inspected. Generally, health departments are capable of inspecting housing for lead hazards. Expert training is needed for safe repair of lead hazards, and pediatricians should discourage families from undertaking repairs on their own. Children should be kept away from remediation activities, and the house should be tested for lead content before the child returns.
3. Know state Medicaid regulations and measure blood lead concentration in Medicaid-eligible children. If Medicaid-eligible children are a significant part of a pediatrician's practice or if a pediatrician has an interest in lead poisoning, he or she should consider participating in any deliberations at the state and local levels concerning an exemption from the universal screening requirement.
4. Find out if there is relevant guidance from the city or state health department about screening children not eligible for Medicaid. If there is none, consider screening all children. Children should be tested at least once when they are 2 years of age or, ideally, twice, at 1 and 2 years of age, unless lead exposure can be confidently excluded. Pediatricians should recognize that measuring blood lead concentration only at 2 years of age, when blood lead concentration usually peaks, may be too late to prevent peak exposure. Earlier screening, usually at 1 year of age, should be considered where exposure is likely. A low blood concentration in a 1-year-old, however, does not preclude elevation later, so the test should be repeated at 2 years of age. Managed health care organizations and third-party payers should fully cover the costs of screening and follow-up. Local practitioners should work with state, county, or local health authorities to develop sensitive, customized questions appropriate to the housing and hazards encountered locally.
5. Be aware of any special risk groups that are prevalent locally, such as immigrants, foreign-born adoptees, refugees, or children whose parents work with lead or lead dust in their occupation or hobby and, of course, those who live in, visit, or work on old houses.
6. In areas with old housing and lead hazards, encourage application for Housing and Urban Development (HUD) or other moneys available for remediation.
7. Keep current with the work of the national Advisory Committee on Childhood Lead Poisoning Prevention and any relevant local committees.

Summaries currently available in NGC from the Advisory Committee on Childhood Lead Poisoning Prevention include:

- Centers for Disease Control and Prevention (CDC). Managing elevated blood lead levels among young children: recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention. Atlanta

(GA): Centers for Disease Control and Prevention (CDC); 2002 Mar. 128 p. [53 references] See the [NGC Summary](#).

- Centers for Disease Control and Prevention (CDC). Preventing lead poisoning in young children. Atlanta (GA): Centers for Disease Control and Prevention (CDC); 2005 Aug. 101 p. [139 references] See the [NGC Summary](#).

Although there is now evidence that even lower blood lead concentrations may pose adverse effects to children, there is little experience in the management of excess lead exposure in these children. Although most of the recommendations concerning case management of children with blood lead concentrations of 15 micrograms/dL should be appropriate for children with lower concentrations, tactics that decrease blood lead concentrations might be expected to be less and less effective as they are applied to children with lower and lower blood lead concentrations.

#### CLINICAL ALGORITHM(S)

None provided

### EVIDENCE SUPPORTING THE RECOMMENDATIONS

#### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not specifically stated.

### BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

#### POTENTIAL BENEFITS

- Prevention of lead poisoning through decreased exposure
- Prevention of cognitive impairment through timely and adequate treatment and management of elevated blood lead concentration

#### POTENTIAL HARMS

Not stated

### IMPLEMENTATION OF THE GUIDELINE

#### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

### INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

#### IOM CARE NEED

Getting Better  
Staying Healthy

#### IOM DOMAIN

Effectiveness  
Patient-centeredness  
Timeliness

### IDENTIFYING INFORMATION AND AVAILABILITY

#### BIBLIOGRAPHIC SOURCE(S)

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#### ADAPTATION

Not applicable: The guideline was not adapted from another source.

#### DATE RELEASED

2005 Oct

#### GUIDELINE DEVELOPER(S)

American Academy of Pediatrics - Medical Specialty Society

#### SOURCE(S) OF FUNDING

American Academy of Pediatrics

#### GUIDELINE COMMITTEE

Committee on Environmental Health

#### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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#### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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#### GUIDELINE AVAILABILITY

Electronic copies: Available from the [American Academy of Pediatrics \(AAP\) Policy Web site](#).

Print copies: Available from American Academy of Pediatrics, 141 Northwest Point Blvd., P.O. Box 927, Elk Grove Village, IL 60009-0927.

#### AVAILABILITY OF COMPANION DOCUMENTS

None available

#### PATIENT RESOURCES

None available

#### NGC STATUS

This NGC summary was completed by ECRI on November 23, 2005. The information was verified by the guideline developer on December 1, 2005.

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